DOCUMENT RESUME

ED 324 293 SP 032 627

AUTHOR Osness, Wayne H.; And Others
TITLE Functional Fitness Assessment for Adults Over 60 Years (A Field Based Assessment).
INSTITUTION American Alliance for Health, Physical Education, Recreation and Dance, Reston, VA.
REPORT NO ISBN-0-88314-447-6
PUB DATE 90
NOTE 36p.
AVAILABLE FROM AAHPERD Publication Sales Office, 1900 Association Drive, Reston, VA 22091.
PUB TYPE Guides - Non-Classroom Use (055) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Body Composition; Body Height; Body Weight; Exercise; Intervention; Muscular Strength; *Older Adults; *Physical Fitness; *Tests

ABSTRACT

This field test to assess the functional fitness of adults over 60 covers of the following areas: (1) body composition; (2) body weight; (3) standing height measurement; (4) flexibility; (5) agility/dynamic balance; (6) coordination; (7) strength; and (8) endurance. Posttest activities are suggested, and a data sheet and exercise consent form are included, as well as a list of suggested resources. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *

Functional Fitness Assessment For Adults Over 60 Years

ED324293

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

B. Anderson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SP032627

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Guidelines For Exercise Programs For Older Persons (Age 50 And Older)

There can be risk in sudden, unregulated, and injudicious use of exercise. However, the risk can be minimized through proper preliminary screening and individualized prescribing of exercise programs. It is important for older persons entering an exercise program to have a medical evaluation by a physician knowledgeable about physical exercise and its implications.

For programs involving vigorous exercises (i.e., exercises that exceed the level of intensity encountered in normal daily activities such as walking and climbing stairs), the medical evaluation should ensure that the individual can participate in vigorous exercise without any undue risk to the cardiovascular and other bodily systems. Normally, a test that ascertains an individual's cardiorespiratory adjustment to the stress of exercise is an advisable part of the examination. Minimally, it would ascertain if the cardiovascular system, by such appropriate indicators as heart rate and blood pressure, can adequately adjust to vigorous exercise.

For exercise programs involving low intensity exercises (i.e., exercises that do not exceed the level of intensity encountered in normal daily activities), participants should have their personal physician's approval.

Regardless of whether or not a program of exercises is vigorous or of low intensity, the following guidelines to ensure the safety of the participants are offered:

1. In that each person's response to the stress of exercise is specific to that individual, it is important that each person's response to exercise be monitored periodically for signs of undue stress (unduly high heart rate, nausea, dyspnea, pallor, pain). Participants should be taught to monitor their own heart rate and to recognize these indicators of stress. Unusual responses should be reported to the exercise leader immediately. Exercise leaders, also, should be vigilant of these warning signs.
2. Every exercise program must have a well-defined emergency plan for exercise leaders to follow in the event of cardiac arrest or other accidents.
3. Exercise programs must have adequate supervision. Exercise leaders should be trained in cardiopulmonary resuscitation (CPR) techniques. At the very minimum, CPR trained personnel should be present during every exercise session or in close proximity to the exercise program.

Since exercise/recreation programs may be new to the participant it is important that the instructor take nothing for granted and expend considerable energy in selecting appropriate activities to meet the varied needs of each older adult. A caring environment based on scientific principles can go a long way to help older adults enjoy the process of the instruction as well as the product of improved physical functioning. They deserve the best.

Functional Fitness Assessment
For
Adults Over 60 Years
(A Field Based Assessment)

Wayne H. Osness
Marlene Adrian
Bruce Clark
Werner Hoeger
Diane Raab
Robert Wiswell

The American Alliance
For Health, Physical Education,
Recreation and Dance

Association For Research, Administration,
Professional Councils, and Societies

Council On Aging And Adult Development

Copyright © 1990
American Alliance for Health, Physical
Education, Recreation and Dance
1900 Association Drive
Reston, VA 22091

ISBN 0-88314-447-6

Purposes of the American Alliance For Health, Physical Education, Recreation and Dance

The American Alliance is an educational organization, structured for the purposes of supporting, encouraging, and providing assistance to member groups and their personnel throughout the nation as they seek to initiate, develop, and conduct programs in health, leisure, and movement-related activities for the enrichment of human life.

Alliance objectives include:

1. Professional growth and development—to support, encourage and provide guidance in the development and conduct of programs in health, leisure, and movement-related activities which are based on the needs, interests, and inherent capacities of the individual in today's society.
2. Communications—to facilitate public and professional understanding and appreciation of the importance and value of health, leisure, and movement-related activities as they contribute toward human well-being.
3. Research—to encourage and facilitate research which will enrich the depth and scope of health, leisure, and movement-related activites; and to disseminate the findings to the profession and other interested and concerned publics.
4. Standards and guidelines—to further the continuous development and evaluation of standards within the profession for personnel and programs in health, leisure, and movement-related activities.
5. Public affairs—to coordinate and administer a planned program of professional, public, and governmental relations that will improve education in areas of health, leisure, and movement-related activites.
6. To conduct other activities as shall be approved by the Board of Governors and the Alliance Assembly, provided that the Alliance shall not engage in any activity which would be inconsistent with the status of an educational and charitable organization as defined in Section 501 (c) (3) of the Internal Revenue Code of 1954 or any successor provision thereto, and none of the said purposes shall at any time be deemed or construed to be purposes other than the public benefit purposes and objectives consistent with such educational and charitable status.

Table Of Contents

Preface v

1 Introduction 1

2 Rationale For The Test 3

3 Test Items 5
- Body Composition 5
  - Body Weight 5
  - Standing Height Measurement 7
- Flexibility 7
- Agility/Dynamic Balance 9
- Coordination 11
- Strength/Endurance 14
- Endurance 16

4 Posttest Activities 19
- Analysis Of Data-Norms 19
- Award System 19
- Intervention Strategies 20

5 Data Sheet 21

6 Exercise Consent Form 22

7 Suggested Resources 24

Preface

This is a field-test to assess the functional fitness of adults over 60 years of age. The test was developed by a committee of AAHPERD that was appointed by the Council on Aging and Adult Development. Members of this committee were Marlene Adrian, Bruce Clark, Werner Hoeger, Wayne Osness (Chair), Diane Raab, and Bob Wiswell. Ray Ciszek was the Alliance Staff Liaison.

The test items included have been tested using a diversified sample of persons over 60 years of age. Items are reliable and, in some cases, statistically valid for persons of this age. Population norms will be made available as a larger number of persons are tested using the described protocols and testing conditions as outlined in this assessment program. Preliminary testing on a larger population was done to (1) establish the practicality of the test in a field-test situation, (2) provide feedback on the range of discrimination among given age and sex groups, (3) establish preliminary norms, and (4) determine which population this test procedure can most effectively serve.

The work of the committee began in November 1986 when the committee charge was reviewed and expanded. It was decided that primary objectives would be to (a) develop an effective field-test to determine the functional capacity of older adults, (b) establish age and sex related norms, (c) publish material relative to the test procedures and normative data, (d) establish a training program for professionals in the field using this information and (e) disseminate the test to professionals in the field through various professional channels. The project committee divided the project into three phases.

Phase I

This phase included a review of the needs, as determined by the committee, for the testing of elderly populations. It involved the identification of the target population, the type of test to be used in a clinical or field test situation, and the persons who would be using the measurement tool. This phase also included the determination of parameters to be used in the test battery as well as the method of data collection.

Phase II

This phase included the treatment of preliminary data to establish the reliability and, possibly, the validity of the measures

selected, the establishment of a method of presentation of the results, and field-testing to establish norms. A large number of professionals throughout the United States was recruited to do a pilot study to establish preliminary norms for test items.

Phase III

This phase included the development of appropriate publications that could be used in the field by professionals to effectively use the test to obtain quality data and compare this data to age and sex peer groups using the norms established in Phase II. It also included an inservice training program to reach a larger audience of professionals and provide appropriate visibility for the testing program through national and international media. This phase will also include a process of continued feedback from users to improve the quality of the test norms established in the earlier development of the test.

The committee initiated the development of the test by identification of physical parameters appropriate for the functional evaluation of elderly populations. A list of parameters was prepared and prioritized. It included the following in priority order: (a) flexibility, (b) endurance, (c) strength, (d) balance, (e) gait, (f) reaction time, (g) posture. The factors affecting the proposed testing program and the implications of using a given procedure were then identified and reviewed. Limitations and guidelines were established followed by the development of protocols to be used for each of the parameters identified. Preliminary testing for each parameter was conducted and the results discussed and evaluated. The procedures, measures of reliability, measures of validity, feasibility of using the test for older populations, and other issues were considered.

The following guidelines were used during the development of this test:

1. The test must relate to the full range of age among older people over 60 years. Options may be used for subgroups.
2. The test would not relate to follow-up prescriptions at this point in time.
3. The test would be nondiagnostic from a pathological point of view.
4. The test would evaluate the physical function of the older adult.
5. The test would be drug independent.

6. The test will not need physician approval. It bears no more risk than life itself.
7. The test will be prepared for paraprofessional use.
8. The test will require only normally available equipment. No purchased equipment would be necessary.

Because the test was to be a functional fitness test for persons over 60 years of age, it was necessary to establish a working definition of functional fitness. It was decided that functional fitness would be defined as "the physical capacity of the individual to meet ordinary and unexpected demands of daily life safely and effectively." This definition indicated the need for a test that was practical and related closely to activities normally encountered by individuals 60 and above. From the total number of prameters studied in the preliminary testing, a second list of parameters to be included was developed. It included the following: (a) body agility, (b) endurance, (c) flexibility, (d) strength, (e) balance, (f) coordination.

Test items were then identified having the potential of measuring a given parameter from this list. Each was either accepted or rejected due to redundancy or failure to meet the stated guidelines. This was done based on preliminary testing and the previous experience of the committee members. The parameters and the selected test items are listed below.

1. Body agility: Agility course
2. Endurance: 880 yard walk with the 220 yard walk, the 440 yard walk and the 660 yard walk as alternatives.
3. Flexibility: Sit and reach test, finger touch, and trunk rotation.
4. Strength: Grip strength, sit/stand test, arm extension with weight, and arm extension at 90° with weight.
5. Balance: One foot stand.
6. Coordination: Ruler test and manipulation test.

The total test structure was then discussed considering the protocols developed, the parameters involved, the items for testing, the scoring procedure, the number of trials to be used, the recording mechanism, and the ability to provide appropriate reliability and validity. It was decided that the committee should proceed with the battery selected and collect another wave of information that would further expand the initial pilot study in an attempt to collect data with a larger range of physical capabilities and ages.

The preliminary testing on a larger population provided information on reliability and validity that reduced the number of

parameters to the present list. Test protocols were then again revised to the present form. Test items are independent and can be used individually. Only those items should be used that will provide accurate data and will not create unnecessary risk or discomfort for the participant.

1 Introduction

The value of physical exercise to the older adult has become increasingly apparent during the last decade. Not only does physical exercise improve functional capacity, but evidence is strong that it contributes to an improved health status and a reduction of health related risks. However, the specificity of a given type of exercise and the intensity of that exercise determines the change one can expect to occur in fitness levels. Change is specific to exercise treatment. This necessitates a careful evaluation of present condition as well as desired outcomes.

Although the opportunity to affect change is great, it is becoming increasingly important to individualize exercise programs and to use the knowledge base available to provide a safe and effective program for the older adult. Therefore, it has become increasingly important that we expand this knowledge base relative to the appropriate amount, duration, and intensity of exercise for a given type of individual, the effects of given types and intensities of activities on a given population, the effect of age and sex, and the consideration of anatomical and physiological limitations of older persons within a given sub group. Although much has been accomplished during the last decade, we have a long way to go to effectively use physical exercise as a means of improving the quality of life for persons over 60.

Critical to the expansion of the knowledge base necessary to establish effective exercise programs for the elderly, is the availability of good measuring techniques. First, it is important to effectively assess the condition of a given individual to determine the appropriate exercise prescription that will reduce risk and enhance physiological and psychological change. Secondly, it is important that the measurement techniques are finite enough to quantify change over a period of time to allow for an adjustment in the exercise prescription and thereby enhance the ability of the program to affect long-term change. Present measurement techniques involve both invasive and noninvasive measures, usually performed in a medical setting. These techniques may not be necessary or desirable for the healthy but physically limited individual. Other measurement techniques involve the development of profiles in a clinical setting. These are usually noninvasive but involve a considerable amount of equipment and skilled personnel. This type of measurement is often used to assess

the effect of a given intervention strategy with relatively small numbers of subjects.

To reach the larger population, it is necessary to have reliable and valid measurement techniques that can be performed by semiskilled professionals without costly laboratory equipment. Although field-tests are less accurate than clinical or medical measuring techniques, these tests can be used effectively.

Field-tests to assess physical function, or functional fitness among older individuals must be designed for the older population with established reliability and validity for that population. These tests should also relate to the daily function of the individual involved which will ultimately affect the quality of life experienced by that individual. This assessment procedure has been designed to serve the larger population through field based measurement techniques that can be used in a facility where older persons live and can be conducted by personnel not necessarily trained for clinical responsibilities.

2 Rationale For The Test

This assessment program has been designed to use the latest scientific information available as it relates to noninvasive assessment of the older adult and the physiological systems that support the physical function of the older adult. It is a functional assessment that can be conducted in a field based setting using large numbers of individuals. Individual results can then be compared to age and sex related norms to assess present condition as well as to assess functional change over time.

When dealing with the older population, one must recognize the increased risk associated with physical activity, particularly during physical assessment when maximal efforts are desired. This test relates to a functional maximal performance during which the individual performs to the best of his or her capacity without discomfort or unusual risk. Assessors must recognize that there is a psychological factor related to the intensity of one's performance which will affect end result. However, the individual is expected to perform to the best of his or her ability within the confines of present physical condition. For the older individual, this condition may be affected by several different kinds of anatomical, physiological, or pharmaceutical factors. Although these factors are very important, it is recognized that these same factors would be involved in the development of an exercise prescription designed to enhance physical functionality. The parameters tested and the test items used were selected because each relates to general fitness and the total battery of tests provides a comprehensive evaluation of the individual considering the guidelines previously expressed in this document.

Body composition is measured by ponderal index which involves the relationship between height and weight. The use of anthropometric measurements was discarded because of the need for specific equipment and techniques. In addition, the formulas that use this information to project percent body fat have not been shown effective for older populations. The hydrostatic weighing technique is simply inappropriate for a field-testing situation.

Flexibility is measured by the sit and reach test, which actually measures the flexibility of the lower back and upper leg. The sit and reach test was selected because this test is a reasonable indicator of total body flexibility in the normal older adult. The procedure was developed using a measuring stick to avoid the need for specific equipment that may not be available in a field setting.

Agility and dynamic balance are measured by a new test that involves total body activity. It involves straight ahead movement, change of direction, and changing body position. The test closely relates to the functional movement of the older individual in daily life situations and also provides for a quantitative assessment of this ability. It is the most comprehensive of all test items used in the test battery.

The coordination test also relates to daily function and concentrates on the neuromuscular efficiency of the arms and hands. It is a practical test and one that has good reproducibility as well as finite measurement potential.

Strength was considered an important component of the test battery. The measurement of strength included an endurance factor using the number of repetitions through a range of motion. The measurement involves the upper body but also has shown good predictability of the total body strength of the older individual. This test was chosen because it was more quantifiable than some of the other field-tests for dynamic strength that are dependent on body weight and moving the body through space.

The endurance test provides a functional assessment of walking ability in older adults. As an assessment of aerobic capacity, validity is moderate but comparable with other walk/run tests based solely on time. The test is highly repeatable after practice in self-pacing. The walk test may be administered in any open, well lighted area with an appropriate surface (even and nonslippery).

Each of the test items used is subject to motivation and psychological factors. These factors cannot be totally eliminated in a field-test situation, but care has been taken to provide the test administrator with appropriate directions to standardize the procedure in such a way that the effect of these factors would be minimized.

3 Test Items

The test items have complete protocols that must be used for the conduct of the test. Protocols should not be altered in any way so that norms can be used to evaluate the data collected from a given individual using norms established for a given age and sex. Each parameter and test item includes the equipment needed, the procedure, the scoring, the trials, and special considerations. The test clinician is asked to carefully review special considerations for the appropriate safety of the participant and the validity of the data.

Parameter: Body Composition

Test Item:	Ponderal Index
Equipment:	Listed under subparameters
Procedure:	Body weight and height are determined using procedures detailed in the subparameters below. The measured weight in pounds is found on the right scale of Figure 1 and measured height is found on the left scale of Figure 1. A straight line is determined using these two points and a straight edge connecting them. The intersection of the center scale provides the reading of Ponderal Index. The higher the Ponderal Index, the greater the degree of leanness.
Scoring:	Record Ponderal Index to the nearest .1 of one unit as the score.
Trials:	Single trial

Subparameter: Body Weight

Test Item:	Weight
Equipment:	Calibrated scale with increments of 1 lb. or smaller
Procedure:	Set the scale on a firm, flat, horizontal surface. Check that the scale is accurate by using known loads prior to testing. Ask the subject to remove shoes and

Figure 1. Ponderal Index $\frac{\text{Ht.}}{\sqrt[3]{\text{Wt.}}}$

overgarments, such as coat, jacket, and sweater.
Ask the subject to step onto the scale and stand without moving.
With subject standing on scale as directed, read the scales to the nearest pound.

Scoring: Record weight in pounds as the score.

Trials: Single trial

Special Considerations: None

Subparameter: Standing Height Measurement

Test Item: Height

Equipment: Tape measure or other graduated scale of length, masking tape, wall

Procedure: Vertically attach a tape measure to a wall that has no molding strip or other protuberances. Ask the subject to remove shoes, and to turn and place the heels together. Ask the subject to stand erect with head upright and eyes looking stright ahead.
With the subject standing as directed, place a flat object, such as a 2"x4"x6" wooden block, ruler, or clipboard, horizontally on the top of the crown of the head with one end of the object against the wall. Read to the nearest half inch the intersection point of the flat object and the tape measure. If it is difficult to see, ask the subjet to stoop slightly and step to one side, but keep the object in place.

Scoring: Record height in feet and inches to the nearest half inch as the score.

Trials: One trial

Special Considerations: None

Parameter: Flexibility

Test Item: Trunk/Leg Flexibility

Equipment: A yardstick, chalk, and masking tape

Set Up: Draw a line approximately 20" long on the floor, or use masking tape to mark this line. Tape the yardstick to the floor perpendicular to

the line, with the 20" mark directly over the line. If masking tape is used for the line, the 20" mark should be right at the edge of the tape. Next, draw two marks on the line, each 6" away from the center of the yardstick (see Figure 2).

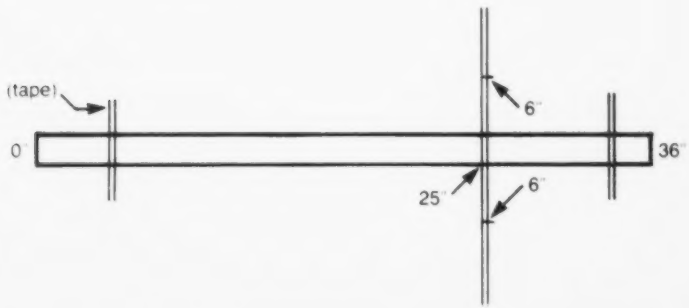

Figure 2. Equipment set-up for the Trunk/Leg Flexibility Test.

Procedure: The subject should remove shoes for this test, and sit on the floor with legs extended, feet 12" apart, toes pointing straight up, and heels right up against the line (at the 20" mark, and each heel centered at the 6" marks on the line). The yardstick should be between the legs, with the zero point toward the subject. The hands are placed one directly on top of the other. The subject may then slowly reach forward sliding the hands along the yardstick as far as possible, and must hold the final position for at least 2 seconds. The technician administering the test should place one hand on top of one of the subject's knees to insure that the subject's knees are not raised during the test.

Scoring: Record the number of inches reached to the nearest half inch for each trial (.0 or .5). The best trial is recorded as the score.

Trials: Two practice trials followed by two test trials are given. Only the score for the two test trials are recorded.

Approximate Range of Scores: 5"-30".

Special Considerations: Be sure that the subjects are properly warmed-up prior to this test. Specific exercises related to this task should be conducted prior to the test. Help all subjects into the sitting position and subsequently when getting up from the floor. The forward reach should be a gradual movement along the top of the yardstick. The tip of the middle fingers must remain even during the entire reaching action, and the final position must be held for at least 2 seconds. Be sure that the toes are straight up and that the legs are kept as straight as possible. If feet start turning outward or the knees start to come up during the reaching action, ask the subject to maintain the correct position.

Parameter: Agility/Dynamic Balance

Test Item: Agility/Dynamic Balance

Equipment: Chair with arms (average seat height: 16", masking or duct tape, measuring tape, two cones, stopwatch

Set Up: The initial placement of the chair should be marked with the legs taped to the floor, or held to avoid moving during the test. Measuring from the spot on the floor (X) in front of the chair where the feet will be placed, the cones are set up with their farthest edge located 6' to the side and 5' behind the initial measuring spot (X). One cone is set up at either side behind the chair (see Figure 3). The area should be well lit, the floor even and nonslippery. Arrows should be placed on the floor in appropriate locations to remind the subjects of the proper pathway.

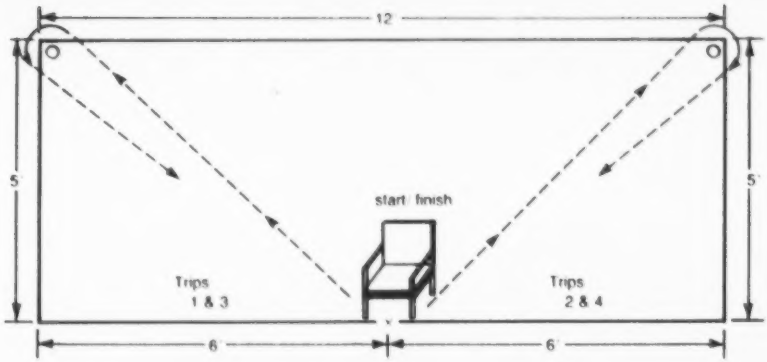

Figure 3. Diagram of Agility Course.

Procedure: The subject begins fully seated in the chair with heels on the ground. On the signal "Ready, go," the subject gets up from the chair, moves to the right, going to the inside and around the back of the cone (counterclockwise), returns directly to the chair, sits down, and raises the feet 1/2" from the floor. Without hesitating, the subject gets up immediately, moves to the left, again going to the inside and around the back of the cone (clockwise), returns directly to the chair, sits down completing one circuit. The subject gets up immediately and repeats a second circuit exactly as the first. One trial consists of two complete circuits (going around the cones four times [right, left, right left]).

During the test, after circling the cones, the subject must sit down fully in the chair. This means he or she must lift the feet 1/2" from the floor before getting up. The subject must use his or her hands to get in and out of the chair. The subject should go as fast as they feel comfortable without losing their balance or falling.

Explain the test procedure, then walk the subject through the course to make sure he or she circles the cones correctly and that subjects lift their feet each time they sit down.

Give the following instructions to the subject: "Walk (do not run) as fast as comfortable without feeling you will lose your balance or fall. One trial consists of circling the cones four times. The first time, go to your right, then to your left, right, and left. Go around the cone from the inside to the outside. Come back and sit down after circling each cone. Sit down fully and lift your feet off the floor each time. Use your hands to help you get in and out of the chair without falling. If you feel dizzy, light headed, or you notice any pain, stop immediately and tell me."

Give directions, supervise practice, and start each trial with "Ready, go." Start the stopwatch when the subject begins to move, stop the watch when the subject sits down the fourth time.

During the test give verbal directions (e.g. right, left, around, sit down, etc.) so the subject does not have to stop or hesitate because he or she is confused. Make sure the subjects lift their feet each time they sit down.

If the subject moves the chair, the technician should readjust it to the original position during the trial.

Trials: A practice "walk through" should be administered until the subject demonstrates that he or she understands the test. Two trials are administered with 30 seconds rests provided after each trial.

Score: Record the time for each trial to the nearest 0.1 seconds. The best trial is recorded as the score.

Approximate Range of Scores: Most people will score between 15-35 seconds.

Parameter: Coordination

Test Item: "Soda Pop" Coordination Test.

Equipment: Three unopened (12 oz.) cans of soda pop, a stopwatch, ¾" masking tape, a table, and a chair

Set Up: Using the ¾" masking tape, place a 30" strip of tape on the table, about 5" from the edge of the table. Draw six marks exactly 5" away from each other along the line of tape, starting at 2½" away from either edge of the tape. Now place six strips of tape, each 3" long, centered exactly on top of each of the six marks previously drawn. For the purpose of this test, each little "square" formed by the crossing of the long strip of tape and the 3" strip of tape is assigned a number starting with 1 for the first square on the right to 6 for the last square on the left (Figures 4 and 6).

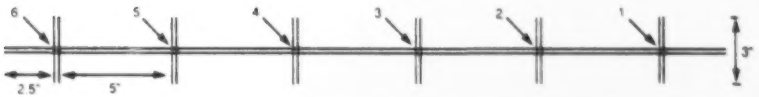

Figure 4. Masking Tape Placement for the "Soda Pop" Coordination Test.

Procedure: To administer the test, have the subject sit comfortably in front of the table, the body centered with the diagram on the table. The preferred hand is used for this test. If the right hand is used, place three cans of pop on the table in the following manner: Can 1 is centered on square 1 (farthest to the right), can 2 on square 3, and can 3 on square 5. To start the test, the right hand, with the thumb up, is placed on can one and the elbow joint should be at about 100-120°. When the tester gives the signal, the stopwatch is started and the subject proceeds to turn the cans of pop upside down, placing can 1 over square 2, followed by can 2 over square 4, and then can 3 over square 6. Immediately, the subject returns all three cans starting with can 1, then can 2, and can 3, returning them to their original placement. On this "return trip," the cans are grasped with the hand in a thumb down position. This entire procedure is done twice, without stopping, and counted as one trial. In other words, two "trips" down and up are required to complete one trial. The watch is stopped when the last

can of pop is returned to its original position, following the second trip back. The prefered hand (in this case, the right hand) is used throughout the entire task (a graphic illustration of this test is provided in Figure 5). The object of the test is to perform the task as fast as possible, making sure that the cans are always placed over the squares. If a can misses a square at any time during the test, the trial must be repeated from the start. A miss indicates that a can did not completely cover the entire square formed by the crossing of the two strips of tape (see Figure 6).

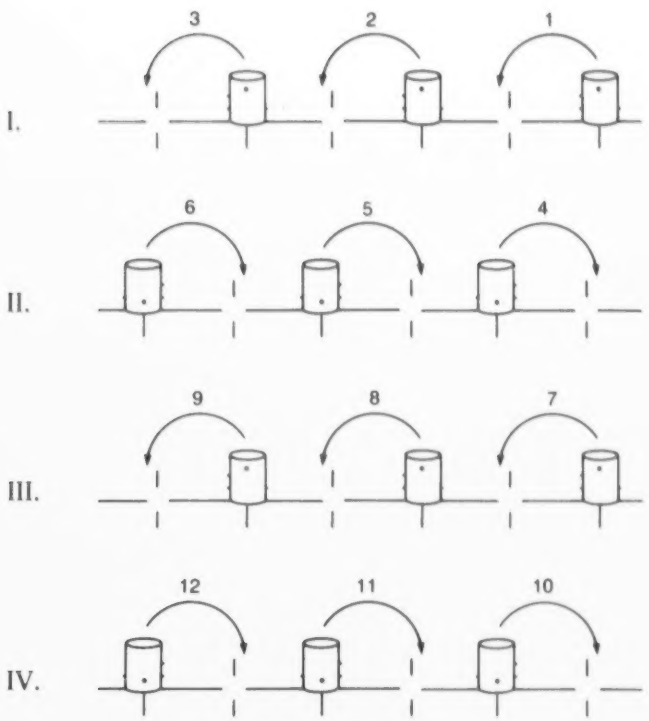

Figure 5. Graphic Illustration of the "Soda Pop" Coordination Test.

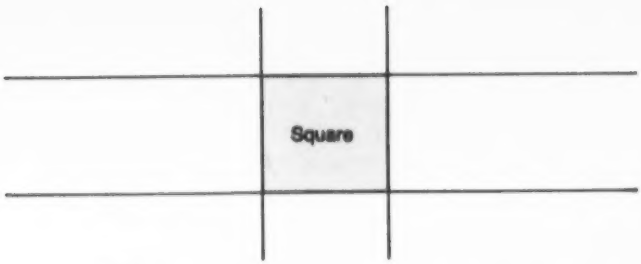

Figure 6. Shaded area illustrates the square that must be completely covered when turning the cans during the "Soda Pop" Coordination Test.

If a participant chooses to use the left hand, the same procedures are used, except that the cans are placed starting from the left, with can 1 over square 6, can 2 over square 4, and can 3 over square 2. The procedure is initiated by turning can 1 upside down over square 5, can 2 onto square 3, and so on.

Scoring: Record the time of each test trial to the nearest 0.1 of a second.

Trials: Two practice trials followed by two test trials are given. Only the scores for the two test trials are recorded. The best trial is recorded as the score.

Approximate Range: 8-25 seconds

Special Considerations: During the entire procedure the cans must completely cover the squares formed by the crossing of the two tapes. If the subject has a mistrial (misses a square), repeat the test until two successful trials are accomplished.

Parameter: Strength/Endurance

Test Item: Strength/Endurance Test

Equipment: 4 and 8 lb. weights, or two quart plastic milk bottle with handle, one gallon plastic milk bottle with handle, sand, water, or other similar material, stopwatch, normal chair without arms, (4 and 8 lb. weights are optional)

Set Up: As an alternative, a 2 qt. empty milk bottle should be filled with sand, water, or other material to 4 lbs. of total weight and the cover tightened. A 1 gal. empty milk bottle can then be filled in the same way to 8 lbs. and the cover tightened. Four and eight pound hand weights are to be used if available and weighed for accuracy. A straight backed chair with no arms is placed in an area with no obstructions.

Procedure: The subject is asked to sit in a chair with the back straight and against the back of the chair as much as possible. The subject's eyes should be looking straight ahead and the feet should be flat on the floor in a comfortable position. The nondominant hand should be resting in the lap with the dominant arm hanging to the side. The subject's arm should be straight and relaxed.

The weight or weighted milk bottle is placed thumbs up, in the dominant hand that is extended toward the floor. The subject is asked to grasp the handle and hold it in the extended position. The 4 lb. weight (quart container) should be used for women and the 8 lb. weight (one gallon container) should be used for men. The running stopwatch should be placed in the nondominant hand resting in the lap and facing the dominant side of the body. The clinician testing the subject should stand on the side of the subject's dominant arm and place one hand on the dominant bicep, helping to support the weight with the other hand. The hand helping to support the milk bottle is then removed and the subject is asked to contract the bicep through the full range of motion until the lower arm touches the hand of the clinician on the bicep. This represents one total repetition. If the subject cannot bring the weight through the full range of motion, the test is terminated with a score of zero.

When the practice repetition is complete, the weight is placed on the floor for approximately 1 minute and again placed in the hand

supported by the clinician. The clinician then instructs the subject to make as many repetitions as possible in 30 seconds. The lower arm must touch the clinician's hand (on the bicep) for a complete repetition.

While watching the timepiece, the clinician instructs the subject to begin (unassisted) and counts the number of repetitions the subject can do in the 30-second period. The clinician starts and stops the time interval at a convenient time on the stopwatch.

Trials: One 30-second trial.

Scoring: Record the maximal number of complete repetitions in the 30-second interval.

Range of Scores: 0-40

Special Considerations:

1. If the subject cannot grasp the handle of the weight to hold it in place this test should not be done.
2. Subjects should be instructed to breathe normally during the test.
3. The weight should not be bounced off the floor. If this is the case elevate the chair.
4. Subjects should be instructed to stop the test if the subject experiences pain in the tested arm. The clinician must determine if the pain is due to a structural condition or lack of strength. If the former, the test will be invalid and no score recorded.

Parameter: Endurance

Test Item: 880 Yard Walk

Equipment: Stopwatch, measuring tape, cones

Set Up: The test involves a continuous walk of 880 yards. The subject will walk around a measured lap until he or she has walked a total of 880 yards. Using a measuring tape or similar device, measure an oval lap as large as possible, and compute the number of laps required to complete 880 yards. Mark the inside edges of the lap (oval or rectangle) with the cones. The lap should be designed with sufficient space to turn to reduce the effects of a quick change in

direction. The area will be well lit, the surface nonslippery and level. All obstacles should be removed from the path. People not taking the test should not be allowed to walk onto the course during the test.

Procedure: Instruct the subject to walk the course (X number of laps) as fast as he or she feels comfortable. Subjects may not run. They should walk at their own pace independent of the other participants. Do not allow people to walk in pairs or groups. It is important they pace themselves so they are able to finish the distance and do not experience discomfort. If a person is dizzy, lightheaded, nauseous, or experiences any pain, he or she should stop the test immediately and inform the assessor. On the signal "Ready, go," the subject begins at a designated spot and walks the necessary laps until he or she reaches 880 yards.

Give directions, start the test with "Ready, go," and start the stopwatch. Either the test administrator or assistant counts laps for each subject and records the time at the completion of 880 yards.

Trials: A single trial is used.

Score: Record the time in minutes and seconds to the nearest second as the score.

Approximate Range of Scores: 5 minutes 0 seconds to 14 minutes 30 seconds.

Special Considerations:

1. Screen individiuals for cardiovascular or orthopedic contraindications.
2. Under the following circumstances the test administrator should either discourage or not allow the participants to perform this test without first consulting their physician:
   a. Significant orthopedic problems that may be aggravated by prolonged continuous walking (8-10 minutes).
   b. History of cardiac problems (i.e., recent heart attack, frequent arrhythmia, valvular defects) that can be negatively influenced by exertion.

c. Lightheadedness upon activity or history of uncontrolled hypertension (high blood pressure).

3. The walk test should be administered last in the battery of tests. The warm-up session is left to the discretion of the test administrator.
4. Individuals should practice walking several days prior to the test to determine an appropriate walking pace.

4 Posttest Activities

Analysis of Data-Norms

To appropriately use the data collected it is necessary to compare that data to either a set of norms or another set of data. Preliminary norms can be established at the local level for each of the parameters using limited numbers of subjects. Because of the large range of age, 60-90 years, it is necessary to have a very large population taken from both sexes to effectively evaluate the data from a given individual. These norms can be item specific so that the test battery can be used as a total assessment but also item by item. The individual item analysis would provide an opportunity for the development of a profile which could then be used for the development of an exercise prescription to improve that profile. Percentile ranking can be used to establish the position of a given individual within a continuum using national norms or norms related to a given population. The establishment of national norms will then lead to the establishment of age and sex specific criteria for evaluation.

Award System

Recognition for achievement is considered desirable for those aspiring to use the test for functional change. Preliminary discussions have suggested that performance in the top 20% in four of the five items would constitute top performance. Performance at the 50 percentile in four of the five test items is considered adequate performance for recognition purposes.

One of the main reasons for the development of a test of this nature is to provide motivation for those using the test. Therefore, some type of recognition is important for those participating in regular physical activity and using this test as a means of self assessment. This may assure a greater degree of personal safety and the proper determination of exercise intensity. An award system can be developed at the local level that will provide incentive for those individuals who are willing to take the test, use the test for the development of a personal strategy to improve physical function, and commit themselves to the program for a certain length of time.

Intervention Strategies

The development of intervention strategies to improve physical function of the adult over 60 years was not part of the charge to this committee. The assessment program was developed to provide an opportunity for more appropriate evaluation of given intervention strategies for specific populations that could be developed in the local setting. The development of norms will provide the basis for the development of more appropriate personal intervention strategies and allow for an appropriately trained clinician to develop these strategies for individuals and groups with similar functional capacities.

It is also intended that computer software will be developed that will not only provide immediate feedback on performance levels but may also provide basic information to the clinician relative to the kind of activity that will effectively improve each of the parameters involved. The importance of trained personnel to evaluate the results of this assessment and the development of individualized intervention strategies cannot be overestimated.

5 Data Sheet

AAHPERD Functional Fitness Assessment For Adults Over 60 Years
Individual Data Collection Form

Name: _____ Testing Date _____ (D / M / Y)

Sex: F M Age: _____ (Years) Location: _____

Test Technician _____

Administer the 5 item test battery in the suggested sequence. (Endurance Walk and Agility/Dynamic Balance tests should not be given consecutively.)

Test Item	Test Trials/Score Trial 1	Trial 2	Final Recorded Score
1. Ponderal Index (to nearest .1 of Unit) Weight	[ ][ ][ ].[ ] lb.		
Height	[ ][ ][ ].[ ] In.		
Ponderal Index	[ ][ ][ ].[ ] Units		
2. Flexibility (score to .5 inch) Practice given, not recorded.	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]
3. Agility/Dynamic Balance - Score seconds & tenths of seconds. Practice given, not recorded	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]
4. Coordination - Score seconds & tenths of seconds. Practice given, not recorded	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]	[ ][ ][ ].[ ]
5. Strength - Score # of repetitions in 30 sec. 4# Women. 8# Men (single lift practice)			[ ][ ]
6. Endurance Walk - Time in minutes and seconds		[ ][ ]:[ ][ ]	

6 Exercise Consent Form

AAHPERD
COUNCIL ON AGING AND ADULT DEVELOPMENT
Medical/Exercise Assessment for Older Adults

NAME _____ PHONE ____/_____ DATE _____

STREET _____ CITY _____ STATE _____ ZIP _____

PART I—TO BE FILLED OUT BY PARTICIPANT

A. ACTIVITY HISTORY

1. How would you rate your physical activity level during the last year?
   - ☐ LITTLE—Sitting, typing, driving, talking—NO exercise planned
   - ☐ MILD—Standing, walking, bending, reaching
   - ☐ MODERATE—Standing, walking, bending, reaching, exercise 1 day a week
   - ☐ ACTIVE—Light physical work, climbing stairs, exercise 2–3 days a week
   - ☐ VERY ACTIVE—Moderate physical work, regular exercise 4 or more days a week
2. What exercise and recreational activities are you presently involved in and how often? _____

B. HEALTH HISTORY

Weight _____ Height _____ Recent weight loss/gain _____

Please list any recent illnesses: _____

Please list hospitalizations and reasons during last 5 years: _____

PLEASE CHECK THE BOX IN FRONT OF THOSE QUESTIONS TO WHICH YOUR ANSWER IS *YES*:

- ☐ Anemia
- ☐ Arthritis/Bursitis
- ☐ Asthma
- ☐ Blood Pressure _____
- ☐ Bowel/Bladder problems
- ☐ Chest Pains
- ☐ Chest discomfort while exercising
- ☐ Diabetes
- ☐ Difficulty with Hearing _____
- ☐ Difficulty with Vision _____
- ☐ Dizziness or balance problems
- ☐ Heart Conditions _____
- ☐ Hernia
- ☐ Indigestion
- ☐ Joint Pain in _____
- ☐ Leg Pain on Walking
- ☐ Lung Disease
- ☐ Shortness of Breath
- ☐ Passing Out Spells
- ☐ Osteoporosis _____
- ☐ Low Back Condition
- ☐ Other Orthopedic Conditions (List) _____

SMOKING: Never smoked Smoke now (how much? _____) Smoked in past

ALCHOHOL CONSUMPTION: None Occasional Often (how much? _____)

List any existing health concerns: _____

Please list medications and/or dietary supplements you regularly take: _____

PART II—TO BE FILLED OUT BY PHYSICIAN DATE OF LAST EXAMINATION _____

A. PHYSICAL EXAMINATION—Please check if it applies to the patient.

- ☐ Resting Heart Rate _____
- ☐ Chest auscultation abnormal
- ☐ Heart size abnormal
- ☐ Peripheral pulses normal
- ☐ Abnormal heart sounds, gallops
- ☐ Resting Blood Pressure _____
- ☐ Thyroid abnormal
- ☐ Any joints abnormal
- ☐ Abnormal masses
- ☐ Other _____

PRESENT PRESCRIBED MEDICATION(S) _____

_____

B. CARDIOVASCULAR LABORATORY EXAMINATION (Within one year of the present date if recommended by physician)

DATE: _____

Resting ECG: Rate _____ Rhythm _____

Axis _____ Interpretation _____

Stress Test: Max H.R. _____ Max B.P. _____ Total Time _____

Max VO_2 _____ METS _____ Type of Test _____

Recommendation for exercise: MODERATE is defined as standing, walking, bending, reaching and light exercise 3 days a week. Please *check* one:

_____ There is no contraindication to participation in MODERATE exercise program.

_____ Because of the above analysis, participation in a MODERATE exercise program may be advisable, but further examination or consultation is necessary, namely: STRESS TEST, EKG, OTHER _____.

_____ Becauce of the above analysis, my patient may participate only under direct supervision of a physician. (CARDIAC REHABILITATION PROGRAM)

_____ Because of the above analysis, participation in a MODERATE exercise program is inadvisable.

C. SUMMARY IMPRESSION OF PHYSICIAN

1. Comments on any history of orthopedic and neuromuscular disorders that may affect participation in an exercise program—especially those checked. _____

_____

2. Message for the Exercise Program Director: _____

_____

_____

Physician: _____ (Please Type/Print) Signature: _____

Address: _____ Phone: _____/_____

_____

PART III—PATIENT'S RELEASE AND CONSENT

_____ RELEASE: I hereby release the above information to the Exercise Program Director.

_____ CONSENT: I agree to see my private physician for medical care and agree to have an evaluation by him/her once a year, if necessary.

SIGNED: _____ DATE: _____

7 Suggested Resources

1. Adrian, M.J. (1981). Flexibility In The Aging Adult. In E.L. Smith and R.C. Serfass (Eds.). *Exercise and Aging: The Scientific Basis.* Hillside, NJ: Enslow Publishers. 45-47.
2. Aniansson, A., & Gustafsson, E. (1981). Physical Training In Elderly Men With Special Reference To Quadriceps Muscle Strength And Morphology. *Clinical Physiology* 1, 87-98.
3. Aniansson, A., Grimby, G., Hedberg, M., Rungren, A., & Sperling, L. (1978). Muscle Function In Old Age. *Scand. J. Rehab. Med.* 6 (Suppl.) 43-49.
4. Astrand, P.O., & Rodahl, K. (1986) *Textbook of Work Physiology.* New York: McGraw Hill Book Co.
5. Barry, H.C. & Rodahl, K. (1986). Exercise Prescriptions For The Elderly. *American Family Physicians,* 34, 155-162.
6. Bookwalter, K.W. (1950). Grip Strength Norms For Males. *Research Quarterly* 21, 249-273.
7. Brozek, J. (1953). Changes Of Body Composition In Man During Maturity And Their Nutritional Implications. *Federal Procedures* 11, 784-793.
8. Grahame, R. (1973). Diseases Of The Joints. In J.C. Brocklehurst (Ed.), *Textbook Of Geriatric Medicine And Gerontology.* Edinburgh: Churchill-Livingstone. 367-381.
9. Hodgson, J.L. & Buskirk, E.R. (1977). Physical Fitness And Age, With Emphasis On Cardiovascular Function In The Elderly. *Journal of American Geriatric Society* 25, 385-392.
10. Kasch, F. W. and Wallace, J.P.(1976). Physiological Variables During 10 Years Of Endurance Exercise. *Medical Science Sports* 8, 5-8.
11. Kenney, R.A. (1985). Physiology Of Aging. *Clinical Geriatric Medicine* 1, 37-59.
12. Lakatta, E. G. (1985). Heart And Circulation. In C.E. Finch and E.L. Schneider (Eds.). *Handbook Of The Biology Of Aging 2nd Ed.* New York: Van Nostrand. 377-413.
13. Lind, A.R., Hunphreys, P.W., Collins, K.J., Foster, K., & Sweetland, K.F. (1970). Influence Of Age And Daily Duration Of Exposure On Responses Of Men To Work In Heat. *Journal of Applied Physiology* 28, 50-56.
14. Londeree, B.R. & Moeschberger, M.L. (1982). Effect Of Age And Other Factors On Maximal Heart Rate. *Research Quarterly For Exercise and Sports,* 53, 297-304.
15. Osness, W.H. (March, 1989). AAHPERD Fitness Task Force: History And Philosophy. *JOPERD,* 64-65.
16. Osness, W.H. (1989). Assessment Of Physical Function Among Older Adults. *Mature Stuff,* AAHPERD Publications, 93-115.

FUNCTIONAL FITNESS ASSESSMENT FOR ADULTS OVER 60 YEARS (A Field Based Assessment)

Sponsored by the
Council on Aging and Adult
Development
of the Association for
Research, Administration,
Professional Councils,
and Societies

An association of the
American Alliance for Health,
Physical Education, Recreation
and Dance

ISBN 0-88314-447-6